

Transitions to sustainable water governance from a social learning perspective

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Freshwater might become a severely limited resource in the future due to climate change coupled with competing water demands for household consumption as well as the production of food, energy, and other goods and services. Sustainable governance of water resources, therefore, is a central part of sustainable development. Scholars in the field of resource and land governance generally agree that a transition to more sustainable development requires rethinking how actor groups organise and negotiate natural resource use (Rist *et al.*, 2007). Consequently, we understand and approach sustainable water governance as a process that involves all relevant actor groups in coordinating resource-related activities, in a way that ensures sufficient and equitable social and economic welfare without compromising the viability and integrity of ecosystems in the long term (Wiek and Larson, 2012). Considering the entirely normative character of sustainability, we further argue that sustainable development can only be concretised in a reflexive, participatory, and deliberative dialogue between all actors involved (Rist *et al.*, 2007).

How can current governance strategies be transformed into more sustainable ones? A possible answer might lie in the social learning approach, which is being explored by a growing number of researchers (Pahl-Wostl *et al.*, 2007; Rist *et al.*, 2007; Schneider *et al.*, 2009). The social learning approach focuses on participatory processes of social change (Woodhill and Röling, 2000) that involve transformations of cognitive, social, and emotional competences as well as of social capital. It involves learning by judicious doing and represents a departure from the more traditional approach of rigid and irreversible planning and management to a concept of policy experimentation including learning by doing and scenario planning.

The research that we present here aims to analyse water governance practices and arrangements in a Swiss Alpine region from the perspective of social learning. The case study region is situated on a southern slope in the driest part of Switzerland. While water is abundant higher in the mountains, the slopes where people live and work are very dry. In the last decades, water shortage was accentuated by increasing water demands related to dynamic socio-economic developments.

For this article, we evaluated how the actors involved have dealt with water shortage in the past and what kind of learning processes were involved. To address these questions, in a first step, we conducted an extensive document review, covering local reports as well as case-specific scientific studies reporting on water governance practices in the region. Then we drew on research by Homewood (in prep), who conducted participatory observation and semi-structured interviews with the key actors involved in water governance in order to better understand the processes involved. Finally, since 2010 we have been organising and facilitating a stakeholder process involving 12 representatives of the main actor groups: water managers, owners, users, and pressure groups.

Our study revealed that the polycentric governance arrangements in place provided various spaces for learning. Common-pool resource management associations (*consortages*) were important learning spaces in the past and have partly retained this function until today. Water users along traditional water channels (*bisses*) collaborate in these associations in order to jointly maintain their water infrastructure and define norms and rules of water distribution. With the growing number of different water uses, the local municipalities, or communes, started to play a major role in organising water supply. This has resulted in a multitude of collaborations within and between communes and other water users. Only in recent years, more formal intercommunal associations were founded in order to coordinate water governance between several communes. However, only few collaborative efforts embrace all communes of the region.

Learning processes taking place within these arrangements are shaped by the actors' continuous involvement in dealing with water shortage on the local scale (learning by doing). As a result, their

responses tend to favour local and step-by-step solutions based on infrastructure and ad-hoc agreements. Today, there is an extensive water supply and distribution infrastructure in place, allowing users to exploit the available water resources efficiently and divert them flexibly. This has enabled the actors to solve many shortage problems. However, this infrastructure network is also fragmented due to its polycentric and step-by-step evolution. For instance, there are three separate networks, preventing water-sharing between the water-rich upstream communes and the downstream communes. Moreover, there are only few scattered examples of efforts to solve water shortage problems by influencing water demand (demand management). Regional planning is most often done without considering the related increase in overall water demand on the regional scale. The absence of a common vision of regional development and water governance is most striking. Will these arrangements in place also work under further climate and socio-economic change?

We conclude that the majority of learning processes in our study region focused on improving the performance of existing institutions and structures at local scale. They all followed the same philosophy of water supply management (single-loop learning). To be more sustainable, however, water governance needs to anticipate future water problems and take into account the well-being of all people in the region. Hence, transitions to more sustainable water governance also requires reflections and actions that transform the underlying norms of collaborations (double-loop learning) and address the societal structures related to these norms of collaboration (triple-loop learning) (Pahl-Wostl et al., 2007). One reason of this situation is related to the lack of adequate learning platforms that go beyond the local level. More emphasis should therefore be placed on investments in social capacities including building confidence, creating joint future visions, as well as continuously monitoring water use, and enhancing transparency regarding intercommunal water management activities.

The emphasis on social learning processes is an important complement to many approaches in transition studies which are often rather technology-centred (e.g. strategic niche management). It puts the focus on redefining and innovating the ethical values and social structures through which technological innovation can be governed.

Literature

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